

distinguishing feature, which is discussed below, to the end of the claim.

Reconsideration of the rejection of claims 1-3 on Kotera under 35 USC §103(a) is requested. Claims 1-3 are directed to a power transmission apparatus composed of a chain and sprocket in combination, and characterized by a defined relationship between the shapes of the teeth of the sprocket and the teeth of the chain link plates.

The Examiner has pointed out that, in Kotera, the height of the inside tooth pitch line, measured from the chain pitch line, could exceed the height of the outside tooth pitch line by a constant, and that, depending on the sprocket diameter, the constant could in some cases be equal to the amplitude H_s of the polygonal motion of the chain. However, regardless of whether or not this feature may be derived from Kotera, there is another feature recited in claim 1 that Kotera clearly does not teach. That feature is that the inside tooth face profiles are identical to that of the teeth of a hob cutter capable of forming the sprocket teeth.

As pointed out in the specification at page 15, lines 8-16, ". . . as the endless silent chain C is spread out linearly, the inside tooth faces 1 of the V-shaped link teeth 10, with which the intended meshing is started, conform in configuration to the profiles of axially linearly arranged teeth of the hob cutter for forming the involute teeth of the sprocket S. This enables initiation of smooth meshing engagement of the inside tooth faces 1 with the sprocket S and keeps the height from a free-span part of the chain C to the center of the sprocket S constant." In other words, in a transmission apparatus in accordance with the invention, the inside faces of the link plate teeth correspond to the hob form, with the result that the meshing of the link plate with the sprocket is similar to the meshing that takes place in the

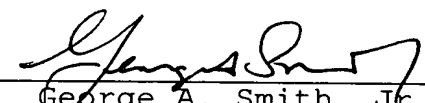
case of a gear, and chordal action due to polygonal movement is reduced.

In short, the invention embodies two features: (a) the height of the inside and tooth pitch line exceeds the height of the outside tooth pitch line (both measured from the chain pitch line) by an amount equal to the amplitude of polygonal motion; and (b) the inside tooth faces have profiles identical to tooth profiles, arranged axially, of a hob cutter capable of forming said teeth of the sprocket. It is this combination of features that produces superior results by way of reduction of vibration, impact noise and tension fluctuations.

The invention as defined in claim 1 (Amended) is neither anticipated, nor shown to have been obvious, by Kotera.

Favorable reconsideration and allowance of this application are requested.

Respectfully submitted,
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Enclosures:

- (a) Marked-up copy of amended paragraph, claims and abstract, showing changes
- (b) Abstract of the Disclosure

**Marked-up copy of amended paragraph, claims and abstract,
showing changes**

Paragraph beginning at page 16, line 19

The link plate 100b is in meshing engagement with the sprocket S with its inside tooth faces 1 on the fore side of the direction of travel of the chain held against the corresponding involute tooth of the sprocket. The pitch line [Pi] Li for the inside tooth face is positioned the distance Hs further away from the pin center line Lp than the pitch line Lo for the outside tooth face. Consequently, the distance from the center of the sprocket S to the pin center line Lp over the link plate 100b of the free span chain part may be expressed by $V+Hs=U$.

claims

1(Amended). A silent chain power transmission apparatus comprising:

- an endless silent chain [comprised of] comprising a multiplicity of link plates connected in interleaved relationship by a multiplicity of connecting pins, each of said link plates having a pair of V-shaped teeth and a pair of pinholes for fitting said connecting pins, [each of said] the V-shaped [link] teeth of each said pair having opposed inside tooth faces defining insides thereof and outside tooth faces defining outsides thereof; and
- a sprocket having a plurality of teeth [for] in intermeshing relationship with said V-shaped teeth of said link plates[,];

[said inside tooth faces having profiles identical to tooth profiles arranged axially of a hob cutter for forming said teeth of said sprocket,]
said inside and outside tooth faces being positioned to satisfy the expression $H_i = H_o + H_s$, where H_i is [a] the distance from a pin center line, passing [over] through the centers of a pair of said connecting pins, to a pitch line of [said] the inside tooth faces of a link plate in which said pair of connecting pins is fitted, H_o is a distance from said pin center line to a pitch line of [said] the outside tooth faces of a link plate in which said pair of connecting pins is fitted, and H_s is [an] the amplitude of polygonal motion of said chain[,];
each of said link plates having a concave bottom surface continuing from and defined between [said] its opposed inside tooth faces at a position [where] to avoid interference of said concave bottom surface with corresponding tooth edges of said sprocket teeth, which arises [owing] due to said [chain] polygonal motion [amplitude] when said outside tooth faces of said link plate are brought into meshing contact with said sprocket teeth and [get] become seated thereon[, can be avoided]; and
said inside tooth faces having profiles identical to tooth profiles, arranged axially, of a hob cutter capable of forming said teeth of said sprocket.

2(Amended). A silent chain power transmission apparatus according to claim 1, wherein said V-shaped teeth have tooth edges profiled at a position where interference of said tooth edges with root bottoms defined between opposed ones of said teeth of said sprocket, which arises [owing] due to said [chain] polygonal motion [amplitude] when said outside tooth

faces of said link [plate] plates are brought into meshing contact with said opposed ones of said sprocket teeth and [get] become seated thereon, can be avoided.

3(Amended). A silent chain power transmission apparatus according to claim 1, wherein the concave bottom surface of [the] each link plate has an arcuate profile.

abstract

[A silent chain power] In a transmission [apparatus comprises] comprising an endless silent chain and a sprocket[. The chain includes link plates each having teeth profiled by inside and outside tooth faces. The] the inside tooth faces of the link plates of the chain are identical to tooth profiles, arranged axially, of a hob cutter for forming teeth of the sprocket. The inside and outside tooth faces [are formed to] also satisfy $H_i = H_o + H_s$, where H_i is [a] the distance from a pin center line L_p [, passing over the centers of pins interconnecting the link plates,] to a pitch line L_i of the inside tooth faces, H_o is a distance from the pin center line to a pitch line L_o of the outside tooth faces, and H_s is [an] the amplitude of polygonal motion of the chain. Each link plate also has a concave bottom surface [defined] between [the] its teeth [thereof at a position where its] to avoid interference with edges of the involute teeth[, arising [owing] due to the chain polygonal motion amplitude when the outside tooth faces are brought into meshing engagement with the involute teeth and [get] become seated thereon[, can be avoided].